What is claimed is:

1.   A network comprising:

2   a network fabric further comprising at least two

3   switches and a plurality of links, each link connected to

4   at least one switch of the at least one switch;

5   a first N_Port connected to a link of the network

6   fabric;

7   a second N_Port connected to a link of the network

8   fabric;

9   wherein there exists a first path and a second path

10   from the first N_Port to the second N_Port through the

11   network fabric;

12   wherein network traffic from the first N_Port to the

13   second N_Port is automatically distributed between the

14   first path and the second path by the switch such that

15   frames transmitted in a first direction and related to

16   any single exchange are transmitted over the same path of

17   the first and second path yet frames transmitted in the

18   first direction and related to different but overlapping

19   exchanges need not follow the same path.

1   2.   The network of Claim 1, wherein the frames

2   related to the any single exchange are identified by

3   a switch as belonging to the single exchange through

4   fields of a frame header comprising an originator

5   exchange identifier field.

1   3.   The network of Claim 2, wherein frames are routed

2   by at least one routing table located within a switch

3   of the at least two switches, the routing table

4   having inputs comprising a hash function of a

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5   destination identifier of the frame header and at
6   least one bit of the originator exchange identifier.

1   4.   The network of Claim 3, wherein the network
2   comprises a switched Fibre Channel fabric.

1   5.   The network of Claim 4, wherein the hash function
2   has input further comprising a field selected from
3   the group consisting of a source identifier field of
4   the frame header and an incoming port number on which
5   the frame was received by the switch.

1   6.   The network of Claim 4, wherein the routing table
2   produces an index to a second table that provides an
3   outgoing port identifier for the switch.

1   7.   The network of Claim 4 wherein a load-balancing
2   task of the network updates the at least one routing
3   table to alter a distribution of exchanges among
4   paths.

1   8.   The network of Claim 4, wherein the hash function
2   further comprises a first hash sub-function of at
3   least one bit of the destination identifier and
4   having an output, a second hash sub-function of the
5   at least one bit of the originator exchange
6   identifier and having an output, and a concatenation
7   operation of the output of the first hash sub-
8   function with the output of the second hash sub-
9   function.

1   9.   The network of Claim 8, wherein the second hash
2   sub-function is a bit select operation.

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1   10. The network of Claim 8, wherein the hash function
2   has inputs further comprising an input selected from
3   the group consisting of an incoming port identifier
4   on which the frame was received and at least one bit
5   of a source identifier field of the frame header.

1   11. A program product for distributing network
2   traffic between a first N_Port of a network and a
3   second N_Port of a network, the network having a
4   plurality of paths for frames from the first N_Port
5   to the second N_Port and at least one switch, the
6   program product operable upon said switch and
7   comprising computer-readable code for:

8   maintaining a routing table, the routing table
9   indexed by an output of a hash function of inputs
10 comprising a destination identification field and an
11 originator exchange identifier field of a header of a
12 frame;
13   causing the routing table to be accessed upon
14 receipt of a frame, the routing table coupled to
15 determine a selected port for transmission of the
16 frame; and
17   causing the frame to be transmitted on the
18 selected port.

1   12. The program product of Claim 11, wherein the hash
2   function has inputs further comprising a an input
3   selected from the group consisting of a source
4   identifier field of the frame header and an identity
5   of a switch port upon which the frame was received.

1   13. The program product of Claim 11, wherein the
2   routing table is coupled to determine a selected port

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3   by providing an index to a second table that provides

4   a selected port identifier.

1   14. A switch for a network capable of distributing

2   frames received on a first port over a plurality of

3   ports, the switch comprising

4   a plurality of ports including a first port, the

5   first port capable of receiving a frame;

6   a routing table capable of determining a port of

7   the plurality of ports for forwarding a received

8   frame based upon an address;

9   a hash function generator capable of generating

10   an address for the routing table based upon

11   information comprising a destination identification

12   field and at least one bit of an originator exchange

13   identifier field of a header of the received frame;

14   a processor for maintaining the routing table;

15   and

16   apparatus for receiving a frame and for passing a

17   received frame to the port determined by the routing

18   table.

1   15. The switch of Claim 14 wherein the hash function

2   generator is capable of generating an address for the

3   routing table based upon information further

4   comprising an identifier selected from the group

5   consisting of a source identifier field of the header

6   of the received frame and an port identifier of the

7   switch port on which the frame is received.

1   16. The switch of Claim 14, wherein the hash function

2   generator further comprises devices to perform the

3   hash function of a destination identification field

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4   and at least one bit of an originator exchange

5   identifier field of the header of the received frame,

6   and the routing table comprises a memory capable of

7   being addressed by the address generated by the hash

8   function.

1   17. The switch of Claim 16, wherein the memory of the

2   routing table is implemented by at least one RAM, the

3   RAM being writable by the processor and coupled to be

4   addressed through a multiplexor capable of selecting

5   a RAM address from the group of addresses comprising

6   an address generated by the processor and the address

7   generated by the hash function.